EXHIBIT E

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

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)	
ORACLE AMERICA, INC.)	
)	
Plaintiff,)	
)	
v.)	Case No. 3:10-CV-03561-WHA
)	
GOOGLE, INC.)	
)	
Defendant.)	
_____)	

REPLY REPORT OF DR. IAIN M. COCKBURN TO THE EXPERT REPORT
OF DR. ALAN J. COX

October 10, 2011 – ATTORNEYS' EYES ONLY

Table of Contents

I.   Introduction

1.   My name is Iain Cockburn. I am currently the Richard C. Shipley Professor and Chair of the Strategy and Innovation Department in the School of Management at Boston University. My qualifications, recent report filings, and testimony are summarized in the expert report I submitted in this matter on September 12, 2011.[1,2]

2.   I have been asked by Counsel to review and comment upon the expert reports of Defendant's expert Dr. Alan J. Cox, filed on October 3, 2011. The expert report of Dr. Cox relies upon the expert report of Dr. Gregory K. Leonard; as such, I have reviewed and cite that report as well.[3] Dr. Cox presents an opinion on copyright damages which he calculates to be between $3.1 and $24.1 million. He also calculates Google's infringer's profits to be $39.6 million. In this report, I present my critiques of Dr. Cox's analysis. In forming my opinions, I have reviewed additional materials beyond those cited in my Opening Report. These include the materials accompanying Dr. Leonard's and Dr. Cox's reports, which include additional documents and data, including Google data which Google had previously been unable to provide me, and various computer programs used by Drs. Leonard and Cox to generate their results. A list of new materials that I have relied upon since my opening report is attached as Appendix A to this report.

3.   I note that I have had one seven days to review and analyze Dr. Cox's report, supporting materials, and cited sources. I reserve the right to identify other errors in Dr. Cox's report, and disagreements with his opinions, up to the time of trial and at trial.

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[1] Complaint for Patent and Copyright Infringement in *Oracle America, Inc. vs. Google, Inc.*, United States District Court in the Northern District of California, CV 10-03561 WHA (Dkt. No. 1).

[2] Expert Report of Dr. Iain M. Cockburn, September 12, 2011, revised September 15, 2011 (hereafter "Opening Report").

[3] Expert Report of Dr. Gregory K. Leonard, Case No. 3:10-cv-03561-WHA, October 3, 2011 (hereafter "Leonard Report"); and Expert Report of Dr. Alan J. Cox, Case No. 3:10-cv-03561-WHA, October 3, 2011 (hereafter "Cox Report").

A.   Summary of My Opening Report

4.   In my Opening Report, I calculated damages from copyright infringement. I calculated actual damages based on considerations of both Sun's lost profits caused by Google's infringement and a hypothetical license negotiation. I estimate recoverable lost profits to be about $136.2 million, or alternatively, I estimate the royalty paid under a hypothetical license apportioned to reflect the relative contribution of the copyrighted intellectual property to the total value of Android to be about $102.6 million.

5.   With respect to infringer's profits, I understand that under the statute, Oracle is required to "present proof only of the infringer's gross revenue, and the infringer is required to prove his or her deductible expenses and the elements of profit attributable to factors other than the copyrighted work."[4] I understand from counsel that the law recognizes that recoverable profits may be direct or indirect, and that indirect profits are those earned not by selling an infringing product, but rather earned from the infringer's operations that were enhanced by the infringement.[5] Notwithstanding the potential breadth of that provision, I limited my calculation of gross revenues from infringement to Google's direct revenues from Android. In particular, I calculate gross revenue earned from Android-based advertising, sales of Nexus smartphones, and sales of applications on Android Market to be approximately $823.9 million, through the end of 2011.

B.   Summary of My Criticism of Dr. Cox's Opinions

6.   I have reviewed Dr. Cox's report on copyright damages. Dr. Cox concludes that the success of the Android operating system is entirely due to Google and is completely unrelated to the alleged copyright violation. I have determined, however, that Dr. Cox makes several substantive errors in reaching this conclusion:

- All of Dr. Cox's opinions reply upon assertions that the copyrighted APIs at issue have little or no value and that Google had viable non-infringing alternatives.

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[4] *Mackie v. Rieser*, 296 F.3d 909, 914 (9th Cir. 2002); *also William A. Graham Co. v. Haughey*, 568 F.3d 425, 442 (3d Cir. 2009).

[5] *Id.*

However, there is no evidence to support such assertions: they are based on unsubstantiated and, at times, contradictory arguments.

- Dr. Cox has put forward two alternate calculations of Google's infringer's profits from Android. One of his calculations is irrelevant and his second calculation is simply wrong.

- Dr. Cox has adopted Dr. Leonard's framework to analyze the hypothetical negotiation and therefore his analysis suffers from the same serious flaws as Dr. Leonard's does.

- Regarding my copyright damages analysis based on Sun's lost profits due to Java ME and project Acadia, Dr. Cox concludes that Sun's Java business was in steep decline for reasons not related to Android. This conclusion is directly contradicted by documentary evidence.

- Finally, Dr. Cox argues that my calculation of Sun's losses is double-counting copyright damages with respect to the calculation of Google's infringer's profits. Based on the nature of the copyright violation, I conclude that no such double-counting exists, Sun's losses are additive to Google's infringer's profits.

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7.   The remainder of this report discusses each of these points in detail. In particular, Section II highlights Dr. Cox's failure to recognize the strategic value of rapid adoption of Android to Google and the contribution of Google's copyright infringement to meeting this goal. Section III describes many of the unsupported and contradictory assertions Dr. Cox makes about the availability of non-infringing alternatives. In Section IV I review Dr. Cox's conclusions regarding my copyright analysis and briefly explain why his conclusions are incorrect and are not supported by the evidence. Section V presents my review of Dr. Cox's affirmative analysis, including his qualitative assertions, his calculation of infringer's profits, and his assessment of a hypothetical negotiation, based on the same reference points (the Sun-Google negotiations from

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2005-2006 and Sun's licenses with Danger and handset manufacturers) as Dr. Leonard's.

Section VI responds to Dr. Cox's criticisms of my lost profits analysis. Section VII concludes.

II.   Dr. Cox Fails to Recognize the Strategic Value of Rapid Adoption of Android to Google, Evidenced in Documents as Early as 2005

8.   Dr. Cox asserts Android's success was due to many other factors beyond the use of the 37 API packages at issue and that Google had non-infringing alternatives to the APIs.   In particular, Dr. Cox claims that Google could have adopted another programming language, such as C++, in which case it would not have been necessary to incorporate, or infringe upon, any Java APIs. [6] However, one of the main advantages to the adoption of Java was that Google could leverage a large base of developers, an important strategic factor in getting Android to market quickly. Dr. Cox fails to consider the risks to Google of delaying the launching of Android and the risks associated with development of critical Android components under very tight deadlines[7], as well as the strategic value of rapid adoption of Android to Google, and the contemporaneous documents and recent testimony that underscore how real the time to market issue was to Google and the critical role of leveraging the Java developer community in getting to market rapidly.

9.   As described in my Opening Report, substantial contemporaneous evidence indicates that Google thought that an early introduction of Android was necessary to ensure a widespread adoption of Android and avoid Google's "lockout" from the mobile market. Rich Miner, cofounder of Android, Inc., referring to Android's initial market entry, explained that "the time was right" for a Java and Linux-based, open-source mobile operating system: "we couldn't have done that at any other point in time."[8] Andy Rubin explained in his deposition that "[y]ou have a window of opportunity in smartphones …You have to ship as soon as feasibly possible. I mean, you go to extraordinary lengths to ship sooner, because it's a very dynamic market. And it

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[6] Cox Report, p. 23. See also pp. 8-9, 17-21.

[7] See, for example, Frederick P. Brooks, "The Mythical Man-Month: Essays on Software Engineering," Anniversary Edition (2nd Edition), Addison-Wesley Professional, 1995.

[8] Gregory T. Huang, "Google's Rich Miner Says Timing Is Everything for Android: Three Thoughts from Mobile Monday," Xconomy Boston, August 17, 2010,
<http://www.xconomy.com/boston/2010/08/17/google%E2%80%99s-rich-miner-says-timing-iseverything-for-android-three-thoughts-from-mobile-monday/>.

could shift directions at any time. So my job as … the architect of this business concept was to just do everything that I possibly could to get my solution to the market in the shortest time possible."[9]

10.   Google's strategy documents also stress the importance of getting Android to market quickly. For example, in 2005, Rich Miner wrote in response to an email stating that it was widely believed that "if an open platform is not introduced in the next few years then Microsoft will own the programmable handset platform" and stated that "[t]he only sentence I don't like at the moment is 'Assuming Android will take two years to develop and deploy…'"[10] Miner confirmed this understanding at his deposition, testifying that Google understood timing was important for the success of Android.[11] These sentiments convey and confirm an urgency to get Android to market quickly and before the end of 2008.

11.   When Android, Inc. was acquired by Google, it had only eight engineers and owned no intellectual property except the android.com domain name.[12] Android Inc. had not done any work on the development of a virtual machine.[13] Probably because of its scarce resources, quick time to market appears to have been a key motivation for Google to enter into a deal with Sun. In presentations given to Google executives at various stages of negotiating that deal, Andy Rubin stressed that the deal would "dramatically accelerate" Google's schedule.[14] And when the deal started to fall apart in mid-2006, Rubin twice warned Google executives that breaking off the deal would have a "schedule impact."[15] Rubin testified that he was "under incredible schedule pressure" to launch Android.[16]

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[9] 7/27/2011 Rubin Dep. 180:1–12.

[10] GOOGLE-01-00019529 at 530.

[11] Miner 5/26/2011 Depo. Tr. at 261:11-262:10.

[12] GOOGLE-12-00000115; GOOGLE-03168864. Another document produced by Google indicates that there were nine Android, Inc. employees, of which only four were engineers. GOOGLE-58-00048925 at 927

[13] Miner 5/26/2011 Depo. Tr. at 33:14-16.

[14] GOOGLE-14-00042244.

[15] GOOGLE-26-00008366 at 374 (March 28, 2008 presentation); GOOGLE-12-00080356 at 365 (April 20, 2006 presentation).

[16] Rubin 7/27/2011 Depo. Tr. at 179:14.

12.   With the launching of Apple's iPhone in 2007, the time-to-market issues became even more pronounced. At an Android Google Product Strategy ("GPS") meeting on January 17, 2007, Andy Rubin described Android as a "technology project, with the goal of quick time to market …."[17] Five months later, in May 2007, notes from an Android meeting show that the team felt that there was a "[r]isk that people may flock to other platforms if we wait too long."[18] These documents indicate that Google believed that it needed to move quickly with Android, something that Dr. Leonard fails to adequately address in his report.

13.   In this context, it is critical to recognize the strategic value to Google of launching Android as quickly as possible. This includes the prevention of "lockout" of core Google services and products in the increasingly-important mobile space;[19] the ability to obtain favorable revenue sharing agreements with handset manufacturers; [20] and the ability to take advantage of other benefits such as network effects and optimal positioning to enter new markets.[21] These benefits to Google would have placed considerable upward pressure on the hypothetical negotiation between Sun and Google, yet Dr. Cox fails to recognize them.

14.   The Java developer community, and Google's access to a large pool of developers, was a determining factor in Google's decision to build a Java-based platform for Android. A November 2006 Google presentation states: "The risk to Google is that as more manufacturers exit the software business, and more 3rd party developers sign on to the MSFT platform because it is ubiquitous and has open APIs, we could face a repeat of the browser wars except this time on handsets: Google has content we'd like to deploy, but are blocked by a competitor that has control of the platform."[22] Google's goal in entering the Android deal with Sun was to create a "[c]ompelling open platform that provides alternatives to Google's being blocked out [of] proprietary offerings."[23]

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[17] GOOGLE-01-00025330 at 333.

[18] GOOGLE-29-00002338 at 339.

[19] Opening Report, pp. 47-51, 139-146.

[20] Opening Report, pp. pp. 55-56, 147-151.

[21] Opening Report, pp. 56-60.

[22] Google, "Eric's question #14 - Mobile Strategy 2007," GOOGLE-01-00024675 at 687.

[23] GOOGLE-24-00013702 at 703; attached to e-mail from Andy Rubin to Rich Miner on 3/6/2006 titled "What's In/What's Out Discussion"

15.   Rubin repeatedly wrote that Android would prevent Google from being blocked by Microsoft and/or Nokia. Rubin wrote Sun: "As discussed, the two companies [Google and Sun] are aligned against a common industry bully."[24] A few months later, Rubin explained internally the strategic significance of Android as a means of addressing this competitive threat: "We need to provide an alternative to MSFT, and we need to do it in such a way as we don't fragment 3rd party developers."[25] On January 19, 2006, Rubin wrote: "Our story is that we feel the industry cannot be BLOCKED by MSFT."[26] Other documents confirm Google wanted to "form an industry alliance to block MSFT."[27]

16.   Dr. Cox's failure to acknowledge these documents, much less consider their significance in analyzing the time to market issue is a significant failure in his report that colors his calculation of the hypothetical negotiation and apportionment of infringer's profit.

III.   Dr. Cox Makes Unsupported and Contradictory Assertions Regarding the Availability of Non-Infringing Alternatives

17.   Dr. Cox asserts that for the alleged copyright infringement, Google had "a good non-infringing alternative to the APIs."[28] Dr. Cox suggests that Google could have used such other languages as C++, Objective C, C, Python, JavaScript, or others. He asserts without contemporaneous support – let alone any attempt at actual quantification – that the choice of the Java programming language over C++ was a very close call and that C++ was possibly the superior choice.[29] Where he does provide support, he cites mainly to his own recent interviews of various Google employees. He does so without addressing the contemporaneous evidence

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[24] Rubin stated in his deposition that he couldn't recall who the "common industry bully" he was referring to was. (Deposition of Andrew E. Rubin, 30(b)6 Deposition, Oracle v. Google, CV 10-03561 WHA, US Dist. Ct., Northern District of California, April 5, 2011, pp. 61); Email from Leo Cizek (Sun) to Matthew Marquis, Subject: "Time-sensitive: Google - Java ME proposal," September 22, 2005, OAGOOGLE0100167795.

[25] Email from Andy Rubin to Dan Bornstein, et. al., Subject: "Re: What are we doing?" April 13, 2006, GOOGLE-02-00111218.

[26] GOOGLE-24-00198138 at 138.

[27] GOOGLE-14-00042244 at 246 (2006 presentation re: deal with Sun).

[28] Cox Report, p. 23.

[29] Cox Report, pp. 23-24.

from the 2005-2006 timeframe, much of which is authored by some of the same individuals whom Dr. Cox cites.[30]

18.   In my opinion, it is more relevant and reliable to evaluate the parties' expectations and beliefs at the time of the hypothetical negotiation with reference to contemporaneous documentary evidence rather than post-litigation, undocumented, and undated interviews with employees of the company that is alleged to have infringed the intellectual property at issue in the lawsuit. Moreover, Dr. Cox fails to recognize the substantial risk associated with reliance on any of the proposed alternative technologies, something that he fails to account for in his analysis. These risks would have been particularly unbearable for Google, given its pressing concerns about time-to-market and performance issues. With respect to the substantial body of contemporaneous evidence as to the importance of the Java APIs to Android, the following quotes are indicative of the contemporaneous evidence that Dr. Cox should have considered:

- In January 2006, Google Android engineer Brian Swetland explained in an internal e-mail: "Reasons to shift to a primarily Java API: - single language massively simplifies the application development"[31]

- In March 2007, Google engineer Bob Lee noted that "The point of the language, VM, and library effort is to provide a familiar and useful set of functionality to developers. . . ."[32]

- In January 2008, Google (and former Sun) executive Eric Chu explained in an internal e-mail that "Android's support of Java programming language does enable all Java developers to quickly leverage their skills to build great Android apps...." and "We enable developers who are familiar with programming in Java to leverage their skills to quickly build Android apps. The APIs in Android

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[30] Dr. Cox's undated and undocumented interviews with four different Google employees appear to be central to his damages framework. In Section IV.A.4 of his report, where he discusses non-infringing alternatives to the APIs at issue, Dr. Cox cites to these interviews 21 times. In the same section, he doesn't cite a single internal Google document (of over 2 million documents produced) to support his assertions.

[31] GOOGLE-01-00019511.

[32] GOOGLE-24-00017719.

enable developers to build extremely capable mobile apps that can rival what can be done on a desktop. . . .")[33]

- In December 2008, a Google presentation noted that Android had an "application framework with Java language APIs - No need for developers to learn a new language or work with low-level programming details"; "Enabling reuse and replacement of components."[34]

19.   Indeed, as Google's own copyright expert, Dr. Astrachan, notes in this report: "Because Android is written in the Java language...Google was practically required to include the APIs at issue."; "The APIs at Issue Are demanded by the Industry."[35] While opining about technical matters beyond his expertise, Dr. Cox ignores the opinion of the expert who is more qualified to address the issue.

IV.   Dr. Cox's Conclusions Regarding My Copyright Analysis are Incorrect and are Not Supported by the Evidence

20.   Dr. Cox argues that the success of the Android operating system is due to many factors that are unrelated to the alleged copyright violation. In particular, he argues that Android's success is entirely due to Google. Dr. Cox reaches eleven separate conclusions in his report. I summarize and briefly address each conclusion here. Additionally, where appropriate, I note the sections in which I discuss in more detail why Dr. Cox's conclusions are incorrect.

21.   First, Dr. Cox concludes that "[t]he material covered in the file claim appears to have little or no value."[36] Dr. Cox further asserts that this is due, at least in part, to the fact that "Google…had very close non-infringing substitutes readily at hand."[37]   Dr. Cox therefore concludes that there are no damages for this file claim. There are at least three problems with this conclusion. First, damages must be assessed based on the copyright infringement as a whole, which is what I did in my Opening Report. Second, I understand that Google has not

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[33] GOOGLE-02-00071778.

[34] GOOGLE-00298438 at 459.

[35] Astrachan Expert Report at pp. 73-77.

[36] Cox Report, p. 2.

[37] Cox Report, p. 2.

removed all literally copied code. Third, Dr. Cox does not appear qualified to offer opinions regarding technical alternatives. Dr. Cox also never explains, as is true with many of his conclusions, why, if non-infringing, equally good alternatives were available, Google never chose to use those instead rather than risk "making enemies along the way" by taking Sun's intellectual property.

22.   Second, Dr. Cox claims that "[t]he success of Android can be explained by factors that are unrelated to the alleged use of the API component of Oracle's copyright claim"[38] such as the fact that Android was open-source and provided an attractive platform for developers.[39] As I have briefly discussed above, in more detail in Section V.A and at length in my September report, the contemporaneous evidence shows that Google viewed the core APIs at issue, as well as the class libraries, as critical to attracting developers to Android. Further, Dr. Cox fails to disentangle the factors that he relies on from the infringement. As discussed in my Opening report, both Google's open-source and alliance strategies are by-products of Google's copyright infringement, and would not have been possible without taking Sun's Java technology – starting with the core APIs and core libraries – and distributing it for free under an open source license.

23.   Third, Dr. Cox concludes that my analysis and that of Dr. Shugan apportion only a small share of Android's advertising revenues to the APIs at issue. It appears that Dr. Cox expected my apportionment share to be larger. Throughout my analysis, however, I erred on the side of being conservative. The apportionment analysis I conduct, based on the conjoint survey of Dr. Shugan, is evidence-based and uses methods supported by the economics and marketing literatures. Dr. Cox does not even attempt to conduct any analysis of the appropriate apportionment amount. As such his "analysis" provides no basis on which Google can fulfill the burden of proving that any of Google's Android profits are attributable to elements other than the copyrights. Thus, the apportionment figure of 15% that I presented in my initial report represents a lower bound with actual apportionment potentially being as high as 100%.

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[38] Cox Report, p. 2.
[39] Cox Report, p. 3.

24.   Fourth, Dr. Cox claims that, as of the date of his report, the costs of developing and marketing Android exceed Android revenues.[40] This conclusion is misleading, as it ignores the fact that Google clearly considered Android a long term investment. As succinctly stated by Andy Rubin in 2007: "Google is investing a huge amount in this project. We think of it as a ten year plan."[41] Moreover, Google's then-CEO, Eric Schmidt, publicly stated in August 2010: "Trust me that revenue is large enough to pay for all of the Android activities and a whole bunch more."[42] Indeed, if an infringer was simply allowed to deduct all costs upfront in a damages scenario, then no litigant would ever be fully compensated for infringement and all infringers would receive a post-litigation profit surplus from their infringement in which they no longer were encumbered by fixed costs. Further, Dr. Cox's decision to front load all costs in the first few years of the life of Android is inconsistent with Google's typical treatment of depreciation which amortizes costs over 12 years for intangible assets and for periods of up to 25 years for property and equipment.[43]

25.   Fifth, Dr. Cox emphasizes that "Oracle's damages expert's own assumption is that the alleged copyright contributed only part of the profits associated with the Android platform" and he estimates damages on this basis to be $39.6 million. Dr. Cox makes conceptual errors in his calculation, as I discuss in Section V.B, which leads him to understate infringer's profits by at least $8 million.

26.   Sixth, Dr. Cox claims "the evidence indicates that the sales of Oracle's Java ME softened for several reasons that are unrelated to the alleged use of the API component of Oracle's copyright claim."[44] However, this is a baseless claim, as I control for these factors in my analysis of lost profits: my analysis is based on Sun's Java ME forecasts, which take into account Sun's assessment of factors such as "obsolescence," fragmentation, and the impact of open sourcing Java ME. I discuss this point in detail in Section VI.

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[40] Cox Report, p. 3.

[41] GOOGLE-01-00030157 at 158.

[42] *International Business Times,* "Does Google Have an Android Revenue-Model?," August 10, 2010 (available at http://www fool.com/investing/general/2010/08/10/does-google-have-an-android-revenue-model.aspx)

[43] Google 10K, for fiscal year ending Dec 31, 2010 at 57.

[44] Cox Report, p. 3.

27.   Seventh, Dr. Cox concludes that there is "significant evidence that Project Acadia failed because of technical difficulties, poor execution and lack of programming personnel after a series of RIFs." As with many of his other assertions, in arriving at this conclusion, Dr. Cox ignores contemporaneous evidence concerning the reasons for the termination of the project, evidence that I cited to in my Opening Report.

28.   Eighth, Dr. Cox places significant weight on then Sun CEO, Jonathan Schwartz's deposition testimony and one document that at the time of the release of Android, Sun believed that the introduction of the new operating system would rejuvenate the Java platform, that it "strapped another set of rockets to the [java] community's momentum."[45] Yet, whether or not Mr. Schwartz believed the statement, the sentiment has no relevance to analysis of Google's infringer's profits and Sun's and Oracle's lost profits. As to the hypothetical license, though Mr. Schwartz's belief at the time of the hypothetical negotiation is a relevant data point, I note that it contradicts a large body of contemporaneous documentary evidence, including Mr. Schwarz's own statements.[46]

29.   Ninth, Dr. Cox notes that he "adjust[s] the estimate of lost profits to fit the facts of this case. These adjustments result in lost profits calculation for Java ME for the period 2009-2011 to be $24.3 million." In Section VI, I conclude these adjustments are not warranted. My opinion regarding losses of $136.2 million is therefore unchanged.

30.   Tenth, Dr. Cox asserts that my opening report "provides no objective evidence that Oracle would ever have licensed to Google the right to use the 37 API packages in the manner it did."[47] This criticism is unfounded as the evidence indicates Sun and Google were negotiating a license for the specific Java intellectual property at issue to be used in Android, including the 37 API packages at issue, and that Sun entered into many agreements covering that intellectual property.

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[45] Cox Report, p. 54.

[46] OAGOOGLE0003904946 (April 20, 2009 email from Schwartz to Larry Ellison stating that he wanted to discuss "battles with Adobe Flash/Google Android").

[47] Cox Report, pp. 4, 15.

31.   Finally, Dr. Cox concludes that relying on the Google-Sun license negotiations in 2006, "an appropriate award under the theory of a lost fair market value license to be $6.2 million," and that relying on the Danger license and a number of Java ME OEM licenses, "an appropriate award would be $21.1."[48] As to the Google-Sun license negotiations, Dr. Cox concludes that the parties would have negotiated a license for $6.2 million, even though he himself asserts that at least $28 million would be an appropriate starting point. He offers no evidence to support such a conclusion. As to the Danger and OEM licenses, Dr. Cox's assessment appears to rest on his incorrect reading of the licenses. The provision in the Danger license concerns Java branding, which was assumed to be lacking in the negotiations between Sun and Google. The provision has nothing to do with compatibility and incompatibility. Similarly, the OEM licenses are not comparable to a hypothetical license, as I have explained, because they require TCK compliance, which Android violated.

V.   Dr. Cox's Affirmative Copyright Analyses Are Seriously Flawed

32.   In his affirmative copyright analysis, Dr. Cox argues that the success of Android is due to many factors unrelated to the alleged copyright violation. In particular, he argues that Android's success is entirely due to Google's actions, and not the alleged copyright infringement. While this leads him to conclude that infringer's profits are really zero, Dr. Cox, nonetheless, presents a calculation of infringer's profits, and he presents two alternative copyright damages calculations based on a hypothetical negotiation framework. I discuss each of these in turn.

A.   Dr. Cox's Focus on Purported Non-infringing Alternatives and Factors Unrelated to Copyright in Establishing Apportionment is Both Wrong and Misplaced

33.   Dr. Cox asserts that the success of the Android operating system is due to many factors, unrelated to the alleged copyright violation. In particular, he argues that "the success of the Android architecture is almost entirely, if not entirely, due to Google."[49] I do not dispute the

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[48] Dr. Cox apparently misquotes his own results in his Summary of Conclusions – he reports these values to be $6.44 and $24.1 million on pp. 64 and 62, respectively, of his report.
[49] Cox Report, p. 16.

fact that Google is the driving force behind Android's success. The issue here is not whether Google or Sun contributed more over the period 2006 to 2011. The pertinent question is what Google would have been able to achieve with all its efforts but for the copyrighted material that is alleged to be infringed. The answer to this question provides useful information as to the outcome of a hypothetical negotiation, and as such, this is one of the issues I studied in my Opening Report. Yet Dr. Cox has provided no analysis to shed light on this important question.

34.   As I explain in my Opening Report, Google recognized early that it would be good for business to attract a large pool of developers. According to Andy Rubin, "[t]here is no purpose of building an open platform other than to attract third-party developers to it. So anything that we would do to jeopardize the support of third-party developers would be bad for the success of the platform."[50] Google saw significant benefit in attracting the Java developers to the Android platform and set out to target that developer community. A contemporaneous Google document (from 2006) states:

> "Fact … 6M Java developers worldwide. Tools and documentation exist to support app development without the need to create a large developer services organization. There exist many legacy Java applications. The wireless industry has adopted Java, and the carriers require its support. *Strategy: Leverage Java for its existing base of developers*."[51]

35.   In his report, Dr. Cox argues that Google could have attracted enough application developers to the Android platform even without relying on Java as the core of Android.[52] However, he does not provide alternative explanations as to why Google had such a keen interest in the Java developers. Nor does he present evidence that Android could have attracted as many non-Java developers and built as large an ecosystem as fast as it did with Java.[53]

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[50] 4/5/2011 Rubin Dep. 91:19-23

[51] GOOGLE-01-00029331 at 331; GOOGLE-01-00025376 (emphasis added).

[52] Cox Report, pp. 17-20.

[53] Dr. Cox points to Apple's success with the iPhone as an example of success of a non-Java platform. However, it is not realistic to believe that Google, with a completely different business model and approach could have replicated what Apple has done. It is informative to keep in mind that Apple is the most valuable company in the world – more valuable than Google or Microsoft. http://www.bloomberg.com/news/2011-08-09/apple-rises-from-near-bankruptcy-to-become-most-valuable-company.html. Arguing that Google could have done as well as Apple is pure speculation.

36.   Dr. Cox's reliance on information from 2011, as compared to the wealth of contemporaneous evidence, is selective. For example, he relies on the observation that "today, many of the most popular Android applications are largely written in C++, rather than the Java programming language, and thus largely by-pass the Dalvik virtual machine."[54] Dr. Cox ignores the fact that today Android is a popular established platform and its economics are very different from what they were at an early stage. Even though a developer may undertake a significant effort to port a C++ application from one platform to another, he would only choose to do that if that platform is large enough to justify the fixed cost of porting. The developers have this incentive today, but would not have had it in 2008-2009, immediately after launch of Android when just a few users had them. Moreover, when the platform is large and there are many developers vying for the sales of applications to users, they have a strong incentive to invest in even minor performance improvements to achieve a better competitive position. So it's no wonder that developers *today* would be turning to writing at least portions of their applications through Android NDK and C++ - that would not have been as important earlier.

37.   Dr. Cox also does not mention the conclusion of Google (and former Sun) engineer Tim Lindholm when he states: "What we've been asked to do (by Larry and Sergei) is to investigate what technical alternatives exist to Java for Android and Chrome. We've been over a bunch of these, and think they all suck. We conclude that we need to negotiate a license for Java under the terms we need."[55]

38.   While focusing on what appears to be the case today, Dr. Cox also ignores the contemporaneous evidence as to the importance of adopting (and infringing) Java APIs specifically to create the rapid, early adoption of Android by developers on which the success of Android depended. Once Android gained momentum and had many users, it is not surprising that many applications would be written in other languages – developers knew there would be a large market for their applications. One cannot assume this momentum, as Dr. Cox does, in assessing the market value for the APIs at issue *as of the time of hypothetical negotiation.*

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[54] Cox Report, pp. 24-25.

[55] GOOGLE-12-10000001. I note that Dr. Cox also ignores Tim Lindholm's 2006 email concerning Google's negotiation with Sun for the use of Java ME, in which he noted that his was a "critical license." (GOOGLE-01-00018836).

39.   For example, Brian Swetland made clear in 2006 that Java was vastly superior to other alternatives, in part due to the copyrighted Java APIs: "Java is more accessable [sic] than C++. There are more Java programmers. There is more standardization in the tools and libraries. Debugging is much simpler (especially for people who are not total rockstars – perhaps a lot of casual developers, etc."[56] In an October 2005 email, Andy Rubin speaks of "do[ing] Java anyway [without a license] and defend our decision, perhaps making enemies along the way" and that "*the alternatives are suboptimal.*"[57]

40.   After considering the evidence regarding the value of the APIs at issue and the lack of non-infringing alternatives, and considering the paucity of real evidence presented by Dr. Cox, I maintain my opinion that the ability to attract the Java developers contributed substantially to Android's success.

B.   Dr. Cox's Calculation of Google Profits from Infringing Revenues are Conceptually Flawed

41.   Dr. Cox undertakes the task of apportioning the revenues Google earned from Android to account for costs incurred and the contribution of copyrighted material to these revenues. He employs two primary approaches: one that focuses on overall Android profitability (as presented in his Exhibit 2a) and one that considers the incremental profitability of Android enabled by the copyrighted materials (as presented in his Exhibit 3a).

42.   Under his first approach, Dr. Cox simply calculates the overall Android profitability *to date* and finds <u>negative</u> profits. Given that Android was commercially launched less than three years ago and platform products like Android require time before recouping initial investments, it is not surprising that Dr. Cox calculates that this overall profitability is negative, even after amortizing engineering expenses. In my view, this method is not a reasonable representation of Google's benefit from Sun's copyrighted materials, as this negative overall profitability is not reflective of the amount of benefit Google received from using Sun's intellectual property. Dr. Cox argues throughout his report that Google would have been able to

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[56] GOOGLE-01-00019511.

[57] GOOGLE-01-00019527-528.

work around Sun's IP and would still have been able to achieve a reasonable level of success with a version of Android that does not infringe on Sun's copyrights. Therefore, the appropriate calculation of Google's profits attributable to copyrights should consider two components: the increase in profits due to increased sales enabled by the copyrights (incremental revenues) and the costs Google was able to avoid by appropriating the IP (incremental costs).

43.   Dr. Cox's second method, presented in his Exhibit 3a, is based on valuing the incremental profit contribution of the copyrights specifically. Dr. Cox appropriately assumes that, absent the copyright violation, Google's revenues in the but-for world would have been lower. He calculates the value of these incremental revenues and associated incremental costs to arrive at the incremental Google profit attributable to the copyrights. In this calculation, he correctly ascribes no incremental costs to categories such as marketing or Android acquisition price – these costs would be just as high in the but-for world as they are in the actual world. He concludes that Google's profits attributable to the copyright violation are $39.6 million.

44.   However, Dr. Cox makes a conceptual mistake in calculating the incremental revenues attributable to the copyrights. He bases his adjustment of the Android revenues on the calculations I performed to estimate the loss of advertising revenues due to a decrease in sales of Android handsets. A critical component of my calculation was to estimate the mitigating effect on advertising revenues from Android users switching to other smartphones (e.g., iPhones) and still performing Google searches.[58] Dr. Cox applies this calculated percentage to all three components of Google's revenues: advertising revenues, Android Market revenues, and Nexus phone revenues. However, such an adjustment is incorrect and understates the incremental profitability attributable to the copyright-at-issue.

45.   While the loss of advertising revenues on Android would be mitigated by users doing more searches on iPhones and Blackberries, the loss of Nexus phone sales would not be mitigated (for Google) by an increase in iPhone sales. Similarly, if there are fewer Android users, there are fewer Android Market applications purchased – the corresponding increase in sales through Apple's App Store does not add to Google's revenues. Therefore, Dr. Cox should

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[58] This calculation is explained in Appendix D of my Opening Report.

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have applied the straight decline in Android smartphone sales to these two categories of revenues, without any mitigating offsets. When I make this correction to Dr. Cox's calculation, Google's profits attributable to copyright violation would equal $47.6 million. This calculation is presented in Exhibit 1.

46.   I also disagree with Dr. Cox's use of the 11.5 percent starting apportionment value. It is my opinion that the copyrights at issue account for at least 15 percent of the value of the hypothetical license and, by implication, Google's incremental profits from Android. Therefore, I rerun Dr. Cox's calculation based on 15 percent of Google's incremental advertising profits attributable to the copyrights at issue. The result of that calculation is $61.3 million. This calculation is also presented in Exhibit 1.

47.   In his calculation, Dr. Cox also neglects to consider the costs Google avoided by relying on the copyrighted Java APIs instead of designing a workaround. The amount of such avoided engineering costs should be added to the amount of profits attributable to the copyright violation. Based on the statute, I understand that it is the defendant's burden to estimate such costs. Given that Dr. Cox does not provide such an estimate, the $61.3 million figure is a lower bound on infringer's profits attributable to the copyright violation.

C.   Dr. Cox's Assessment of Copyright Damages Based on the Hypothetical Negotiation is Flawed

48.   Dr. Cox presents a number of analyses of a hypothetical license between Sun and Google in Section G of his report.[59] These analyses mirror those performed by Dr. Leonard in his patent report and in fact cite to some of Dr. Leonard's calculations. Therefore, I am not going to describe or criticize these analyses here. My comments on Dr. Leonard's analyses, outlined in my reply to Dr. Leonard's report,[60] apply here as well.

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[59] Cox Report, pp. 4 and 59-64. Note that when Dr. Cox presents his results in his "Summary of Conclusions," he apparently misreports his own results. In particular, he reports the value of the license based on Sun-Google negotiations being $6.2 million, while the same number is reported to be $6.44 million on p. 64. Similarly, he reports the value based on the Danger negotiations to be $21.1 million in the Summary of Conclusions and $24.1 million on p. 62.

[60] Reply Report of Dr. Iain M. Cockburn to the Expert Report of Gregory K. Leonard, October 10, 2011.

49.   Dr. Cox also claims "it would be speculative to assume that Sun (now Oracle) would have licensed Google's competitive use of the APIs at issue."[61] I find this assertion misguided, first because the purpose of a hypothetical negotiation is to assume what would happen if the infringer had entered into an agreement rather than infringe and second, because Dr. Cox himself presents two alternative analyses of hypothetical negotiations. As Dr. Cox is aware, there was an actual negotiation between Sun and Google in 2005-2006 with the goal of Google licensing all of the relevant IP, including the patents in suit, other patents, and applicable trademarks and copyrights. Thus, there is no reason to presume that the APIs would not have been licensed by Google or offered by Sun for a license. I build a hypothetical license based on that actual negotiation, as described in my Opening Report. One of my methods of calculating copyright damages is based on apportioning the lost fee from this hypothetical license to the copyrights at issue. There is nothing speculative about this approach.

50.   I also note that Dr. Cox uses an 11.5 percent apportionment ratio to apply to the value of the hypothetical license to calculate copyright damages. He claims that it is my "average 11.5 percent apportionment."[62] However, it is wrong and misleading to use this percentage. The numbers Dr. Cox cites were calculated based on Google's loss in profits in the but-for scenario in which it doesn't violate Sun's copyrights. These were not "apportionment" percentages. The percentages that Dr. Cox focuses on are just one of the inputs into my opinion as to the appropriate portion of the value of the hypothetical license attributable to the copyright. I consider other evidence in forming my opinion, including Sun's and Oracle's actual losses due to the copyright violation, as well as the substantial volume of documentary evidence I have reviewed and cite in my reports. My opinion is that no less than 15 percent of the value of the Aggregate Hypothetical License should be attributed to the copyrights at issue. This would be the correct percentage to apply to any hypothetical license value to calculate copyright damages.

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[61] Cox Report, p. 59.

[62] Cox Report, p. 64.

VI.   Dr. Cox's Criticisms of My Lost Profit Calculations are Unfounded

51.   Dr. Cox also advances a number of critiques of my lost profits analysis. In my Opening Report, I calculate losses on Java ME and project Acadia. I outline Dr. Cox's critiques and my reactions below. In summary, I believe that Dr. Cox's critiques are unfounded..

52.   Dr. Cox disagrees with my calculation of Java ME losses attributable to Google's copyright violation and contends that I: 1) should not have used the "Strategic Forecast" for Java but instead used one of the hypothesized scenarios; 2) should have excluded a number of Java mobile products from the calculation; 3) should have compared the forecasted revenues with actual revenues; 4) should have accounted for the fact that Java ME may be suffering from competition from iOS; 5) should have accounted for Android still being present in the but-for world where no copyright violation occurred (to avoid supposed double-counting with Google's infringer's profits). I discuss each of these critiques below.

A.   Use of "Strategic Forecast"

53.   Dr. Cox criticizes my lost profits calculation on the basis that I incorrectly used a "best case scenario" forecast[63] included in a document produced by Oracle. [64] In offering an alternative lost profits calculation, Dr. Cox relies on a lower set of numbers from that document, and calculates a lower copyright damages.

54.   Based on my further review of that document and other documents produced by Oracle, it is my opinion that Dr. Cox's interpretation of this document is incorrect, I have used the correct forecasts from that document, and that Dr. Cox's calculations are unreliable because he has used a set of numbers that do not actually reflect Sun's JavaME revenue forecasts.

55.   The document at issue[65] was attached to a May 22, 2009 email from Craig Gering titled "FOU Analysis," in which Mr. Gering wrote that "the #'s used were forecasts done a long time ago …."[66] The document itself contains a worksheet that is titled "Strategic Forecast" and

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[63] Cox Report, p. 56.
[64] OAGOOGLE0100164541.
[65] OAGOOGLE0100164541.
[66] OAGOOGLE0100164539.

which includes forecasts and all three separate modifications to those forecasts, labeled Low, Medium, and High. Those modifications purport to reflect some degree of "shift to open source" over time. However, the adjustments are very basic, calculated as a possible decline of 25, 50, or 75 percent.

56.   The projections reflected in this spreadsheet that I rely upon actually appear in another document that was sent on January 7, 2008, by Michael Pfefferlen.[67] Mr. Pfefferlen was at that time Sun's Finance Director, Worldwide Software Sales,[68] and Mr. Pfefferlen wrote: "I've attached the FY'09 Strategic fcst."   The fact that the numbers that I rely upon appear in this other document suggests that these were not a "best case scenario" as compared to the Low, Medium, and High scenarios reflected in the other document, as suggested by Dr. Cox. Rather, they were Sun's actual forecasts.

57.   The "shift to open source" scenarios upon which Dr. Cox relies appear to stem from a dispute at the JCP (Java Community Process)[69] at that time over removing the "Field of Use" (FOU) restriction in Java SE licenses – *a change that* Sun *never, in fact, implemented* and is not about open-sourcing Java more generally.[70] The subject line of the e-mail to which the forecast was attached, "FOU Analysis", ties these scenarios to Sun's *hypothetical* analysis of scenarios based on the dispute.

58.   Dr. Cox claims that he is being "conservative" by using the "high" scenario, but I believe that his reliance on any one of the scenarios is misguided, as not appear to reflect any assessment of the impact of Sun's decision to open source JavaME, which occurred in November

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[67] OAGOOGLE0001873933.

[68] http://www.linkedin.com/pub/michael-pfefferlen/b/962/a98.

[69] The JCP is the governing body for Java development. See www.jcp.org.

[70] The dispute was as follows. The Apache Software Foundation lobbied Sun to remove the field-of-use restriction from the open-source Java SE license, which would have allowed SE implementations (which were released under a freer open-source license) less restrictive. See Apache's "Open Letter to Sun Microsystems," http://www.apache.org/jcp/sunopenletter.html; Removing the field-of-use restriction would have allowed Apache and possibly others to distribute Java more broadly, including through commercial installations in the mobile space, for example, through the Android platform. This would have clearly created challenges for Sun's licensing strategy and could have severely undermined its Java revenues. Jeet Kaul testified about the dispute (See Jeet Kaul Depo. Tr. 193 *et seq*.), including that Sun never implemented this change.

2006.[71] Dr. Cox identifies no evidence that supports his interpretation of this document, which is contrary to both the document itself (the "FOU analysis") and other documents produced by Oracle. Given his fundamental misinterpretation and misuse of this document, I believe that Dr. Cox's lost profits calculations are incorrect.

59.   Further, given that neither Sun nor Oracle ever removed that FOU restriction, Dr. Cox's claim that the Strategic Forecast should be adjusted because of something that never actually happened in the actual world is wrong; it is therefore correct to use the Strategic Forecast to project the but-for world with no impact from the copyright infringement in Android.

B.   Inclusion of Java Products Into Calculation

60.   Dr. Cox argues that certain Java products, such as Java TV and embedded Java, should not have been included in my calculation of Sun's lost Java profits. He argues that it is "unreasonable to assume that Oracle lost profits in those service lines to Android."[72]

61.   I disagree with Dr. Cox on this point. The damage from Android's introduction is not limited to Java ME specifically, but extends to the broader Java platform. As I have described in my Opening Report,[73] there was a significant loss of developer interest in the Java platform after Android has launched and Java generally suffered from a decline in mindshare. Moreover, it has always been clear that Java Micro Edition is found in devices beyond simple phones in everything from Coke machines to Blue Ray DVD players, as stated in my initial report. Indeed, one obvious example of this is a recent Android design win. Amazon has an agreement for Java ME for its Kindle e-readers. The company recently announced that its new Kindle product, Kindle Fire, would contain an Android OS.[74] Finally, this impact extends beyond Java ME, which makes the inclusion of additional Java revenues reasonable from an economics point of view.

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[71] See GOOGLE-01-00025454 (November 12, 2006, e-mail to Google engineers providing preview of November 13, 2006, press release announcing adoption of GPLv2 license for Java implementations).

[72] Cox Report, p. 57.

[73] Cockburn Opening Report, p. 115.

[74] http://www.engadget.com/2011/09/28/amazon-fire-tablet-unveiled-7-inch-display-199-price-tag/.

62.   If one were to limit the analysis to just the line items most closely associated with Java ME, as Dr. Cox has done, the calculated Java ME losses would, in fact, increase. In Exhibit 2, I present a modified Exhibit 20 from my Opening Report, where I use revenue categories selected by Dr. Cox to perform the calculations. The loss in Java ME profits increases from $118.3M to $152.9M. My inclusion of additional categories of Java revenues, such as JavaTV or embedded Java, actually decreases the calculated Java losses from Android's introduction and is therefore conservative.

C.   Use of Actual Revenues Instead of Direct Evidence

63.   Dr. Cox argues that I should not have used the direct evidence of Android's impact from Sun employees. Instead, he proposes using actual data from FY2011 to compare against the forecasts. There are two issues with this approach. First, the actual revenues recognized by Sun in 2011 could very well be higher than Sun forecasts from 2008. However, this would not mean that there is no Android impact on Java ME revenues. Sun/Oracle could have found alternative business strategies for distributing Java that enabled them to earn more money from Java. Alternatively, business conditions overall could have improved, again improving Java's profitability. However, this does not refute the fact that Sun profits suffered significantly from Android's introduction as a Java-based smartphone platform.

64.   Sun employees have reported significant declines in OEM licensing revenue due specifically to Android. For example, on July 16, 2010, Vineet Gupta noted that "[n]ot too many new design wins recently – android stealing lime light [sic] currently."[75] A July 2010 Oracle presentation makes the point more succinctly: "Android impact = Revenue Decline – Android has severely damages [sic] handset Java sales and future trending is poor."[76] Dr. Cox clearly ignores evidence documenting the fact that Android was a direct factor in eliminating Java ME licensing revenues.

65.   Oracle's Dan Green summarized the impact of Android as follows:[77]

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[75] OAGOOGLE0000792257.

[76] OAGOOGLE0013120000 at 006.

[77] OAGOOGLE0000799926.

> "I see Android and am run over by it in all accounts:
> Sprint -> decrease of Java ME investment, heavy investment in Android and 4G
> Verizon -> decrease of Java ME investment, heavy investment in Android (Droid*)
> AT&T -> decrease of Java ME investment, heavy investment in Android and iPhone
> T-Mobile -> decrease of Java ME investment, first mover on Android

66.   Indeed, as recently as last month, Amazon announced that the Kindle, formerly designed and built around Java ME technology, would be supplemented by a new edition running Android OS.[78]

67.   In my analysis, I rely on a statement by the Sun product marketing team, expressed in a 2009 business presentation, which explained that "Android will eliminate >$45 million, (~50%) of Java ME revenue in the next 18 months."[79] This statement is corroborated by evidence from individual OEMs that switched to Android, eliminating opportunities for Java. In my calculations, I compute a $47.8 million loss of Java ME revenues due to Android in 2011, consistent with the evidence. Even if Sun/Oracle were able to recover some of these losses through alternative business strategies or other means, it doesn't necessarily absolve Google of all responsibility for the losses it directly inflicted on Sun's Java business.

68.   Second, in his calculations, Dr. Cox uses data for the first two months of FY2011 to project Sun/Oracle revenues for all of 2011. I find this calculation to be unreliable as Sun's licensing revenues are often collected in lump sum and revenues accumulated over two months is likely to present an inaccurate picture of revenues for the full year. For example, some of Sun's Java licenses were structured in such a way that the OEM would pay a large portion or all the money upfront and an adjustment would be made later in the year to reflect the actual number of Java units shipped. With such a payment structure, looking at any particular point in time to estimate the annual level of revenues would be highly unreliable.

69.   For these reasons, I consider the proposed adjustment inappropriate.

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[78] http://www.engadget.com/2011/09/28/amazon-fire-tablet-unveiled-7-inch-display-199-price-tag/.

[79] Sun Microsystems, "Helping Drive Revenue: Java," OAGOOGLE0000457616 at 617.

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(Contains Confidential and Highly Confidential/Attorneys' Eyes Only Material)

D.   Accounting for Competition from iOS

70.   Dr. Cox argues that some of the Java ME losses are attributable to the increase in the sales of the iPhone.[80] However, Dr. Cox does not present any evidence to support his assertion. At the same time, he ignores the direct evidence cited above that Java ME was losing revenue (and was expected to lose 50% of it) to Android specifically – not iPhone.

71.   Dr. Cox also focuses on the market share that iOS is capturing, and he applies that percentage adjustment to the Java ME revenue levels, disregarding the fact that the smartphone market has grown substantially over the 2008-2011 period. The fact that one product is growing its market share does not imply that another product (whether a substitute or not) cannot grow its sales.

72.   In making this adjustment, Dr. Cox also ignores the fact that Java revenues are impacted not just through a shift of units, but for other reasons as well. First, due to an overall decrease in demand, Java is suffering through price erosion.[81] Second, as I have explained in my Opening Report, Java was suffering from declining developer interest and an overall loss of mindshare – due to the Java-compatible Android. As I demonstrated in Exhibit E10 to my Opening Report, the loss of developer interest in Java was highly correlated with the increase in developer activity on Android.

73.   For these reasons, I believe that this adjustment is inappropriate.

E.   Double-Counting of Sun's Losses with Google's Infringer's Profits

74.   Dr. Cox argues that the calculated Java ME and Acadia losses should be reduced to a small portion thereof to account for the fact that the copyright infringement contributed to Android only marginally.[82] I understand his theory that, in the absence of the copyright

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[80] Cox Report, p. 58, Exhibit 4b.

[81] For example, one Oracle document reflects that Amazon, which uses Java ME in the Kindle, was "[l]ooking for Java alternatives including Android. Asking for lower royalty structures." Oracle, JavaME FY11 Revenue Drop, OAGOOGLE0000725014 at 014.

[82] Cox Report, p. 58.

violation, Android would retain over 80 percent of its sales volume and, therefore, Java ME and Acadia would still be substantially impacted.

75.   In his analysis, Dr. Cox disregards an important fact. In the but-for world, in the absence of the API copyright violation, Android would be incompatible with Java. Dr. Cox argues that Google would have likely "chosen a language other than the Java programming language" and therefore "it would not have needed to incorporate any Java APIs and thus would have avoided the alleged infringement of the API packages."[83] However, in the absence of this compatibility, Android's introduction would not have been the cataclysmic event for Sun and Java as it has been in reality.

76.   In the absence of Java compatibility, Android would have become just another generic competitor to Java. For example, Symbian is an open operating system and its presence on the market for many years has not had a significant negative impact on Java. In fact, the presence of an Android that was incompatible with Java could have increased Java revenues to the extent that any OEMs would have chosen to include Java on their Android smartphones, similar to RIM's inclusion of Java ME on its Blackberry devices. As I have described above, Java was important to the wireless carriers and was a key differentiating feature for Sun's products. Google itself recognized it, stating in a 2006 presentation: "The wireless industry has adopted Java, and the *carriers require its support*."[84]

77.   Similarly, for Acadia, it was the Java compatibility and the free nature of Android that lead to the demise of the Acadia project. As Sun's CEO Jonathan Schwartz recognized as early as October 2008: "…either [Sun and Google] find a way to work together - or [Google's Android] become[s] our biggest competition..."[85]

78.   Also, as I have explained above, Java-compatibility of Android has caused an overall decline of interest in Java. This effect would have been absent if Android was just another operating system, allowing Java to preserve its niche.

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[83] Cox Report, p. 23.
[84] GOOGLE-01-00029331 at 331; GOOGLE-01-00025376 (emphasis added).
[85] OAGOOGLE0019195260.

79.   Therefore, it is my opinion that this adjustment is inappropriate.

VII.   Conclusions

80.   My opinion of Sun's losses due to copyright infringement is unchanged from my Opening Report: Sun has lost $136.2 million from Google's copyright infringement. With respect to the hypothetical license approach, my opinion as to the apportionment of the value of that license to the copyright infringement is similarly unchanged – at least 15 percent should be apportioned to the copyrights at issue. I have recalculated the dollar value of copyright damages based on the hypothetical license to account for Armstrong operating expenses – these damages are $89.6 million through the end of 2011. I have also calculated the copyright damages based on the hypothetical license through September 2011 – they are $61.7 million.

81.   Google's infringer's profits attributable to the copyright violation are no less than $61.3 million, and likely significantly higher in light of the substantial evidence establishing the importance of the copyright material to Android.

Iain M. Cockburn
October 10, 2011

Exhibit 1
Correction to Dr. Cox's Calculation of Google's Wrongful Profits
Attributable to Copyright Infringement
January 2008 - September 2011

Line Item	Profit and Loss with Infringement	Dr. Cox's Analysis		Correction to Dr. Cox's Analysis		Analysis based on 15% opinion	
		Dr. Cox's Assumed Incremental Effect of Infringement	Incremental Profit and Loss Attributable to Infringement	Corrected Incremental Effect of Infringement	Corrected Incremental Profit and Loss Attributable to Infringement	Incremental Effect of Infringement	Incremental Profit and Loss Attributable to Infringement
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
USD amounts shown in millions							
Revenue							
Android Gross Ad Revenues	$ 544.3	8.1%	$ 44.0	8.1%	$ 44.0	10.6%	$ 57.5
Nexus Phone (DTC) Revenues	115.2	8.1%	$ 9.3	13.6%	$ 15.6	17.1%	$ 19.7
Android Market Revenues	31.3	8.1%	$ 2.5	13.6%	$ 4.2	17.1%	$ 5.4
Total Revenue	**$ 690.8**		**$ 55.8**		**$ 63.8**		**$ 82.6**
Cost of Sales							
TAC	$ 180.6	8.1%	$ 14.6	8.1%	$ 14.6	10.6%	$ 19.1
Operations	20.7	8.1%	$ 1.7	8.1%	$ 1.7	10.6%	$ 2.2
COS (incl. DTC)	120.1	-	-	-	-	-	-
Selected Operating Expenses							
Marketing	$ 126.4	-	-	-	-	-	-
Product Management ("PM")	11.0	-	-	-	-	-	-
Amortized Engineering Expenses	170.8	-	-	-	-	-	-
Sales Expenses	15.9	-	-	-	-	-	-
Purchase Price of Android	$ 10.9	-	-	-	-	-	-
Milestone Payments	60.0	-	-	-	-	-	-
Profit	**$ (25.5)**		**$ 39.6**		**$ 47.6**		**$ 61.3**

Notes and Sources:

[1] - [2] See Exhibit 3a of Dr. Cox's rebuttal report.

[3] = [1] * [2]
[4] 13.6% = (1/2) * (19.2% + 7.9%). See Exhibit 3d of Dr. Cox's rebuttal report.
[5] = [1] * [4]
[6] Based on 15% decline in incremental Google ad revenues.
[7] = [1] * [6]

Exhibit 2
Oracle Lost Profits - Java ME
2009 - 2011

	FY2009	FY2010	FY2011	TOTAL	
Forecasted Java ME Revenue	$134.7M	$145.9M	$145.9M	$426.5M	[1]
Actual Java ME Revenue	$97.7M	$95.5M	$47.8M	$240.9M	[2]
Lost Java ME Revenue	$37.0M	$50.4M	$98.1M	$185.6M	[3]
Incremental cost of goods sold	$2.8M	$3.8M	$7.4M	$14.1M	[4]
Incremental sales expenses	$3.7M	$5.0M	$9.8M	$18.6M	[5]
Total incremental costs	$6.5M	$8.9M	$17.3M	$32.6M	[6]
Lost Java Mobile/Embedded Profits	$30.5M	$41.5M	$80.9M	$152.9M	[7]
Harm to Sun from Fragmentation of Java Products	Not Quantified				[8]
Total Java Lost Profits	$30.5M	$41.5M	$80.9M	$152.9M	[9]

Notes and Sources:
[1] Strategic Forecast, OAGOOGLE0100164541. Revenues from "Java ME (JME)" and "Java ME Support" are classified as Java ME revenues. Forecasted revenue is held constant at the FY2010 level, through FY2011.
[2] Java Billings Summary, OAGOOGLE0100167800. Includes only Java ME revenues. FY2011 revenues are reduced by 50% in accordance with Sun's anticipation of Android impact (based on OAGOOGLE000457616).
[3] = [1] - [2]
[4] = [3] * 7.6%. Based on average COGS for 2006. FY07 MEP Business, 2007, OAGOOGLE0005039944 at 946.
[5] = [3] * 10%. Based on average sales costs for 2006. FY07 MEP Business, 2007, OAGOOGLE0005039944 at 946.
[6] = [4] + [5]
[7] = [3] - [6]
[8] Includes lost profits on non-ME versions of Java due to Java fragmentation, loss of strategic opportunities due to a weakene
[9] = [7] + [8]

Appendix A

Documents Considered

Court Documents

Expert Report of Dr. Iain M. Cockburn, September 12, 2011, Revised September 15, 2011.

Expert Report of Dr. Gregory K. Leonard, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, October 3, 2011; Exhibits and Backup.

Expert Report of Dr. Alan J. Cox, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, October 3, 2011; Exhibits and Backup.

Supplemental Summary and Report of Erez Landau, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, September 12, 2011.

Summary and Report of Noel Poore, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, August 6, 2011

Expert Report of Dr. David I. August, Ph.D, Regarding the Non-Infringement of U.S. Patent No. RE38,104, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, August 25, 2011

Expert Report of Dr. David I. August, Ph.D, Regarding the Non-Infringement of U.S. Patent No. 6,910,205, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, August 25, 2011

Expert Report of Jack W. Davidson, Ph.D, Regarding the Non-Infringement of U.S. Patent No. 7,426,720, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, August 25, 2011

Expert Report of Terrence Parr, Ph.D, Regarding the Non-Infringement of U.S. Patent No. 6,061,520, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, August 25, 2011

Expert Report of Terrence Parr, Ph.D, Regarding the Non-Infringement of U.S. Patent No. 5,966,702, Oracle v. Google, Case No. 3:10-cv-03561-WHA, US Dist. Ct., Northern District of California, August 25, 2011

Reporter's Transcript of Proceedings, Before the Honorable William Alsup, No. C10-3651 WHA, US Dist. Ct., Northern District of California, July 21, 2011.

Oracle America v. Google - Expert Report of Iain Cockburn – October 10, 2011 - Reply to Dr. Cox's Report
Subject to Protective Order
(Contains Confidential and Highly Confidential/Attorneys' Eyes Only Material)

Deposition Testimony

Deposition of Richard Miner, Oracle v. Google, Case No. CV 10-03561 WHA, US Dist. Ct., Northern District of California, May 26, 2011.

Deposition of Jeet Kaul, Oracle v. Google, Case No. CV 10-03561 WHA, US Dist. Ct., Northern District of California, August 5, 2011.

Case Documents

GOOGLE-01-00017154	GOOGLE-58-00048925
GOOGLE-01-00018428	GOOGLE-59-00030150
GOOGLE-01-00028497	GOOGLE-80-00081369
GOOGLE-01-00030157	OAGOOGLE0000799926
GOOGLE-01-00075935	OAGOOGLE0000457617
GOOGLE-01-00081881	OAGOOGLE0000488495
GOOGLE-04-00055169	OAGOOGLE0000792257
GOOGLE-12-00000115	OAGOOGLE0001338191
GOOGLE-12-00000473	OAGOOGLE0001873933
GOOGLE-12-00006964	OAGOOGLE0002778476
GOOGLE-12-00080356	OAGOOGLE0003904946
GOOGLE-17-00069037	OAGOOGLE0009707202
GOOGLE-24-00013702	OAGOOGLE0013120000
GOOGLE-24-00017719	OAGOOGLE0013996761
GOOGLE-26-00008366	OAGOOGLE0014009710
GOOGLE-29-00002338	OAGOOGLE0014021245
GOOGLE-29-00004478	OAGOOGLE0100004779
GOOGLE-38-00009472	OAGOOGLE0100006249
GOOGLE-40-00002441	OAGOOGLE0100167795

Publicly Available Documents

Bajari, Patrick and Ali Hortascu, "Economic Insights from Internet Auctions," Journal of Economic Literature, Vol. XLII (June 2004) pp. 457-486.

Ben Cheng and Bill Buzbee, "A JIT Compiler for Android's Dalvik VM," May 2010, Google I-O Presentation, available at http://www.google.com/events/io/2010/sessions/jit-compiler-androids-dalvik-vm.html.

Brooks, Frederick P., "The Mythical Man-Month: Essays on Software Engineering," Anniversary Edition (2nd Edition), Addison-Wesley Professional, 1995.

Brown, Jeffry R. and Austan Goolsbee, "Does the Internet Make Markets More Competitive? Evidence from the Life Insurance Industry," Journal of Political Economy, Volume 110, No. 3 (June 2002), pp. 481-507

Christopher Adams, "Estimating Demand from eBay Prices," International Journal of Industrial Organization, 25(2007), pp. 1213-1232.

"Comments of Gregory K. Leonard, Ph.D.," Evolving IP Marketplace – Comment, Project No. P093900, available at http://www.ftc.gov/os/comments/iphearings/540872-00033.pdf, at p. 14.

Dan Bornstein, "Dalvik JIT," Android Developers Blog, May 25, 2010, available at http://android-developers.blogspot.com/2010/05/dalvik-jit.html

Fisher, Franklin and Craig Romaine, "Janis Joplin's Yearbook and Theory of Damages," Journal of Accounting Auditing and Finance, pp. 145-157.

Jerry A. Hausman, Gregory K. Leonard, and J. Gregory Sidak, "Patent Damages And Real Options: How Judicial Characterization of Noninfringing Alternatives Reduces Incentives to Innovate," Berkeley Technology Law Journal, 22:825 (2007), pp. 825-853, at 835.

Paarsch, Harry J. and Han Hong, 2006. "An Introduction to the Structural Econometrics of Auction Data." The MIT Press.

Who We Are – eBay Inc, accessed October 6, 2011 at http://www.ebayinc.com/who.

Yannis Bakos, "The Emerging Landscape for Retail E-Commerce," Journal of Economic Perspectives, Volume 15, No. 1 (Winter 2001), pp. 69-80

http://9to5google.com/2011/07/07/gloomy-prognosis-for-samsung-in-spite-of-impressive-phone-sales/

A-3

http://www.bizjournals.com/triangle/stories/2009/08/24/daily63.html; and

http://www.gartner.com/it/page.jsp?id=1654914.

http://www.bloomberg.com/news/2011-08-09/apple-rises-from-near-bankruptcy-to-become-most-valuable-company.html

http://www.engadget.com/2011/09/28/amazon-fire-tablet-unveiled-7-inch-display-199-price-tag/

http://www.apache.org/jcp/sunopenletter.html

http://www.google.com/intl/en/press/pressrel/20071105_mobile_open.html

http://www.linkedin.com/pub/michael-pfefferlen/b/962/a98

Third-Party Data

Localytics platform, OS version, and device model application use data, January 2010 – July 2011, available at www.localytics.com